

REMARKS

The Examiner is thanked for the performance of a thorough search.

By this amendment, Claims 1-3, 9-11, 14-20, and 22-26 have been amended, Claims 8 and 21 have been cancelled, and no claims have been added. Consequently, Claims 1-7, 9-20, and 22-26 are currently pending. All issues raised in the Office Action mailed March 7, 2006 are addressed hereinafter.

SUMMARY HAS BEEN ADDED

There is no requirement that a U.S. patent application include a summary. For example, 37 C.F.R. § 1.73 indicates that the presence of a summary is optional, as evidenced below:

A brief summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede the detailed description. (37 C.F.R. § 1.73, emphasis added)

If the presence of a summary was not optional, then 37 C.F.R. § 1.73 would not state that is “should” precede the detailed description, but instead, that the summary must precede the detailed description.

MPEP § 608.01(d) also reflects the fact that the presence of a summary is optional. For example, while MPEP § 608.01(d) states guidelines for what the summary *should* do, nowhere does MPEP § 608.01 state what a summary *must* do, e.g., MPEP § 608.01 lacks any suggestion that the presence of a summary is a mandatory requirement.

However, for ease of examination, Applicants have amended their specification to include a summary. Consequently, it is respectfully submitted that the objection to the specification has been overcome.

CLAIMS 14-26 ARE DIRECTED TO STATUTORY SUBJECT MATTER

To be statutory under 35 U.S.C. § 101, the result of a claim must be useful, tangible, and concrete. With the exception of the requirement that the result of the invention be tangible, Applicants are not aware of any other tangibility requirement relating to 35 U.S.C. § 101. The Patent Office is invited to identify any legal authority that supports the position that 35 U.S.C. § 101 includes a requirement that an embodiment of the invention be tangible¹. For example, other than alleging that Claims 14-26 are directed towards a computer-readable medium that may correspond to a transmission media that cannot be touched or perceived, the Patent Office has not identified any legal authority to support the rejection made under 35 U.S.C. § 101.

Moreover, notwithstanding the fact that the rejection under 35 U.S.C. § 101 lacks a proper basis in law, the rejection also relies upon a premise that is factually incorrect. The Office Action states that acoustic or light waves, such as those generated during radio-wave and infra-red data communications, are not capable of being touched or perceived. However, it is precisely because acoustic waves may be touched or perceived by the human ear that humans are able to hear. For example, acoustic waves cause tiny bones in the middle ear of a human to vibrate, in turn causing nerve impulses, which enable a human to perceive sound waves, to be generated and received by the brain. Also, Applicants respectfully submit that anyone who has experienced a sunburn would disagree that light waves are incapable of being touched or perceived.

Moreover, modern computers are just as capable of reading instructions from transmission media as they are from storage media. For example, modern computers routinely include wireless interfaces that allow them to read instructions carried on

¹For example, 35 U.S.C. § 101 states that a process is one of the four statutory classes of patentable subject matter, but yet a process is not tangible. Therefore, it is clearly incorrect to say that an invention must be tangible to qualify as patentable subject matter.

wireless communications links. From the perspective of a computer, a transmission medium, such as a wireless communications link or an optical wave, is no less tangible than a storage medium, such as a hard disk. Certainly, data carried over a transmission medium may be touched or perceived, otherwise wireless networks could not exist. For example, cell phones enable voice data to be exchanged over a wireless transmission medium. If a cell phone could not perceive the voice data received over the wireless transmission medium, then cell phones would not work. It is therefore respectfully submitted that even if 35 U.S.C. § 101 is interpreted to include a tangibility requirement, that this requirement is satisfied by the pending claims.

By this amendment, Claims 14-26 have been amended to recite “computer-readable storage medium.” The Patent Office has issued over 5,000 patents that recite at least one claim directed towards a computer-readable storage medium. For example, issued U.S. Patents 7,065,755, 7,065,740, and 7,065,715 each recite at least one claim directed towards a computer-readable storage medium. Moreover, a computer-readable storage medium is clearly an article of manufacture, which is one of the four statutory categories of patentable subject matter under 35 U.S.C. § 101. The amendments to Claims 14-26 are made to clarify that a computer-readable storage medium stores one or more sequences of instructions may be executed by one or more processors of a machine. The amendments to Claims 14-26 are not made to disclaim any embodiments where instructions are transmitted or received over a transmission media prior to being stored on the computer-readable storage medium.

For the foregoing reasons, withdrawal of the rejection of Claims 14-26 under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter under 35 U.S.C. § 101 is respectfully requested.

THE PENDING CLAIMS ARE PATENTABLE OVER THE CITED ART

Claims 1-26 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,324,533 (hereinafter *Agrawal*). It is respectfully submitted that Claims 1-7, 9-20, and 22-26, as amended, are patentable over *Agrawal* for at least the reasons provided hereinafter.

CLAIM 1

Claim 1, as amended, recites:

“within a database server, receiving a database statement that specifies frequency criteria and additional criteria; and performing said frequent itemset operation as part of execution of the database statement to produce results, wherein the results include frequent itemsets that satisfy both said frequency criteria and said additional criteria, and wherein the results do not include frequent itemsets that satisfy said frequency criteria but do not satisfy said additional criteria.”

Neither of the above-quoted elements are disclosed, taught, or suggested by *Agrawal*.

Claim 1 is directed towards an approach for performing a frequent itemset operation. According to the approach of Claim 1, a database server receives a database statement that specifies frequency criteria and additional criteria. The frequent itemset operation is performed as part of the execution of the database statement to produce results. Advantageously, the results include frequent itemsets that satisfy both the frequency criteria and the additional criteria, but do not include frequent itemsets that satisfy the frequency criteria but do not satisfy the additional criteria. In this way, frequent itemsets may be identified that satisfy additional criteria in addition to the frequency criteria.

In sharp contrast to the features of Claim 1, *Agrawal* describes an approach where frequent itemsets may be identified that satisfy frequency criteria, but not frequent

itemsets that satisfy any additional criteria other than frequency criteria. As a result, numerous elements of Claim 1 are not disclosed, taught, or suggested by *Agrawal*.

Claim 1 recites the element of “within a database server, receiving a database statement that specifies frequency criteria and additional criteria.” *Agrawal* lacks any teaching or suggestion of this element. While *Agrawal* does describe a database statement that specifies frequency criteria, *Agrawal* lacks any teaching or suggestion of a database statement that specifies both frequency criteria and additional criteria.

To evidence how *Agrawal* fails to show this feature of Claim 1, dependent Claims 9-11 shall now be discussed. Dependent Claims 9-11 are directed towards examples of the additional criteria which may be specified by a database statement; however, none of the portions of *Agrawal* cited to show these dependent claims actually discuss any additional criteria beyond that of frequency criteria.

Claim 9 recites, “the additional criteria specify a minimum length.” As featured in Claim 9, a minimum length refers to a number of items in a frequent itemset. Col. 5, lines 21-23 and Col. 12, lines 52-55 of *Agrawal* are cited to show Claim 9; however, rather than showing a database statement that specifies frequency criteria and a minimum length, this portion merely discusses finding all combination of items that occur more often in a set of items than a specified number (i.e., frequency criteria). Those combinations of items that do occur more often than a specified number are referred by *Agrawal* as being “supported.” Thus, the phrase “minimum support” by *Agrawal* does not refer to a minimum number of items that all item sets must contain. In other words, the “minimum support” discussed in *Agrawal* refers to no more than the frequency threshold, and it does not refer to how many items a frequent itemset may contain. For example, *Agrawal* states:

“An example of such a rule might be that “30% of transactions that contain beer also contain diapers; 2% of all transactions contain both these items.” Here 30% is called the CONFIDENCE of the rule, and 2% the SUPPORT of the rule. (Col. 5, lines 12-16).

Since *Agrawal*’s use of minimum support refers to the minimum frequency a frequent itemset must possess, knowledge of whether a particular frequent itemset has minimum support does not impart knowledge of whether that itemset contains a minimum number of items. For example, one frequent itemset may have a frequency of 90%, but have two items, while another frequent itemset may have a frequency of 15%, and have 30 items. Thus, if a particular frequent itemset needs to have a frequency of at least 50% to have minimum support, knowing that a frequent itemset does have minimum support does not inform one of whether the number of items in the frequency itemset meets or exceeds a minimum number. As a result, the concepts of (a) *Agrawal*’s minimum support and (b) a minimum length as claimed in Claim 9 are orthogonal. Consequently, Claim 9 cannot be disclosed, taught, or suggested by *Agrawal* as *Agrawal* lacks any discussion of “additional criteria specify a minimum length” as featured in Claim 9.

Another example of *Agrawal* lacking any discussion of a database statement that specifies additional criteria in addition to frequency criteria is illustrated by Claim 10. Claim 10 specifies that the “additional criteria specify a maximum length.” The portion of *Agrawal* cited to show this element (Col. 8, lines 4-6) states, *in toto*:

The schema of F consists of $k+2$ attributes ($item_1, \dots, item_k, support, len$), where k is the size of the largest frequent items and len is the length of the itemset.

Nothing in this portion suggests a database statement that specifies a maximum length. Instead, this portion merely describes storing the frequent itemsets of size K in table F_k .

Thus, the term k does not refer to a maximum number of items a frequent itemset may have, but rather simply refers to how large a table needs to be. *Agrawal* lacks any suggestion of “performing a frequent itemset operation whose results exclude all item sets that include more items than the maximum length specified by the additional criteria” as required by Claim 10. In contrast to the requirements of Claim 10, there is no suggestion in *Agrawal* of performing a frequent itemset operation whose results exclude all item sets that include more items than the maximum length specified by the additional criteria. Consequently, Claim 10 cannot be disclosed, taught, or suggested by *Agrawal*.

As another example of *Agrawal* lacking any discussion of a database statement that specifies additional criteria in addition to frequency criteria, Claim 11 recites the feature that “additional criteria specify a set of one or more included items; and the step of performing the frequent itemset operation includes performing a frequent itemset operation whose results exclude all itemsets that do not include all items in said set of one or more included items.”

Agrawal lacks any teaching or suggestion of these features of Claim 11. For example, the portion of *Agrawal* cited to show the features of Claim 11 (Col. 3, lines 2-16) merely discusses removing certain itemsets from further consideration if they do not meet confidence criteria, which is operationally defined by *Agrawal* as meaning the percentage of all items that include a set of items. Thus, the confidence criteria of *Agrawal* qualifies as frequency criteria as claimed, but does not qualify as “specify a set of one or more included items.” For example, Claim 11 requires that a database statement identify a set of one or more included items, and performing the frequent itemset operation includes performing a frequent itemset operation whose results exclude all itemsets that do not include all items in said set of one or more included items. The

cited portion of *Agrawal* lacks any teaching or suggestion of a database statement that identifies a set of items, let alone teaching or suggesting the performance of a frequent itemset operation whose results exclude all itemsets that do not include all items in specified in a database statement. Therefore, *Agrawal* cannot disclose, teach, or suggest the subject matter of Claim 11.

As shown in the above discussion of Claims 9-11, *Agrawal* lacks any teaching or suggestion of a database statement that specifies both frequency criteria and additional criteria. Consequently, *Agrawal* cannot disclose, teach, or suggest the element of “within a database server, receiving a database statement that specifies frequency criteria and additional criteria” recited in Claim 1.

Claim 1 also recites the feature of “performing said frequent itemset operation as part of execution of the database statement to produce results, wherein the results include frequent itemsets that satisfy both said frequency criteria and said additional criteria, and wherein the results do not include frequent itemsets that satisfy said frequency criteria but do not satisfy said additional criteria.” No portion of *Agrawal* teaches or suggests this element. As explained above, no portion of *Agrawal* teaches or suggests a database statement that specifies frequency criteria and additional criteria, and so *Agrawal* cannot teach or suggest this element as well.

As at least one element in Claim 1 is not disclosed, taught, or suggested by *Agrawal*, it is respectfully submitted that Claim 1 is patentable over *Agrawal* and is in condition for allowance.

CLAIMS 2-7, 9-20, AND 22-26

Claims 2-7, 9-20, and 22-26 all depend, either directly or indirectly, from Claim 1 and include all of the limitations of Claim 1. It is therefore respectfully submitted that

Claims 2-7, 9-20, and 22-26 are patentable over *Agrawal* for at least the reasons set forth above with respect to Claim 1. Furthermore, it is respectfully submitted that Claims 2-7, 9-20, and 22-26 recite additional limitations that independently render them patentable over *Agrawal*, e.g., reasons why the subject matter featured in Claims 9-11 and 22-24 is not shown by *Agrawal* were discussed above.

CONCLUSION

It is respectfully submitted that all of the pending claims are in condition for allowance and the issuance of a notice of allowance is respectfully requested. If there are any additional charges, please charge them to Deposit Account No. 50-1302.

The Examiner is invited to contact the undersigned by telephone if the Examiner believes that such contact would be helpful in furthering the prosecution of this application.

Respectfully submitted,

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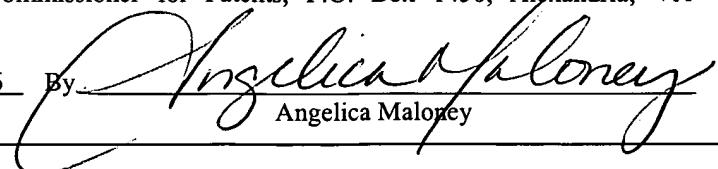

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On July 6, 2006 By 

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